UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JAN 27 2015

Mr. Thomas Frick
Director
Division of Environmental Assessment & Restoration
Florida Department of Environmental Protection
Mail Station 3000
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Frick:

The United States Environmental Protection Agency has completed its review and is approving the revisions to establish a Site Specific Alternative Criterion (SSAC) for pH for Pace Swamp located in Santa Rosa County, Florida. These revisions were considered and approved by the Environmental Regulatory Commission on August 21, 2014. The revisions were adopted by Florida Department of Environmental Protection on September 16, 2014, and became effective for state purposes on October 6, 2014. The revisions were submitted by letter dated September 25, 2014, from Matthew Z. Leopold, General Counsel for Florida Department of Environmental Protection, to Heather McTeer Toney, Regional Administrator, U.S. EPA Region 4 and included a certification that the revisions to Florida water quality standards (WQS) "were duly adopted pursuant to state law".

The SSAC for pH establishes a revised water quality criterion for Pace Swamp located in Santa Rosa County, Florida, as described in paragraph 62-300.800(e). Pace Swamp remains classified and protected for all designated uses of Class III waters, including recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The revised criterion states the "pH shall not exceed 7.0 standard units in more than 10 percent of the measurements collected, nor vary below natural background".

As laid out in the enclosed decision document, titled *United States Environmental Protection Agency Determination Under § 303(c) of the Clean Water Act - Review of the Site Specific Alternative Criteria for Pace Swamp,* review of the documentation submitted by the State, demonstrated that the revised pH criterion for Pace Swamp is scientifically defensible and protects the Class III designated uses of the wetland. Therefore, the SSAC is consistent with the provisions of 40 CFR Part 131.11 and the Clean Water Act (CWA). In accordance with section 303(c) of the CWA, the EPA is hereby approving the SSAC as a revision to Florida WQS.

We would like to commend you and your staff for your continued efforts in environmental protection for the State of Florida. Should you have any questions regarding the EPA's action today, please contact me at (404) 562-9345 or have a member of your staff contact Ms. Cecelia Harper, Florida Water Quality Standards Co-Coordinator at (404) 562-9418.

Sincerely,

James D. Giattina
Director
Water Protection Division

cc: Mr. Mathew Z. Leopold, FDEP
Mr. Eric Shaw, FDEP

United States Environmental Protection Agency's Determination
Under Section 303(c) of the Clean Water Act
Review of the pH Site-Specific Alternative Criterion
for Pace Swamp located in Santa Rosa County, Florida.

Introduction

This document summarizes the United States Environmental Protection Agency's review of a Site-Specific Alternative Criterion (SSAC) developed by Florida Department of Environmental Protection for pH for Pace Swamp located in Santa Rosa County, Florida. The Florida Environmental Regulation Commission considered and approved the amendments to Rule 62-302.800, F.A.C., at a public hearing on August 21, 2014. FDEP subsequently filed the amendments for adoption with the Florida Department of State under section 120.54, F.A.C., on September 16, 2014, after which the rule amendments were duly adopted under state law. Under sections 303(a)-(c) of the Clean Water Act (CWA), 33 U.S.C section 1313(a)-(c), states are required to establish water quality standards (WQS) and submit them to the Environmental Protection Agency for approval or disapproval. Likewise, revisions to a state's WQS must also be submitted to the EPA for approval or disapproval. FDEP submitted the SSAC to the EPA, Region 4 for review under section 303(c) of the CWA by letter dated September 25, 2014. As set out more fully below, the EPA is approving this SSAC as a new or revised WQS.

Background

Pace Swamp has a Class III designated use, which requires the protection of fish consumption, recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The pH criteria currently applicable to Class III freshwaters, including Pace Swamp, under paragraph 62-302.530(51)(c), F.A.C., are as follows:

Parameter	Units	Criteria
(51)(c) pH (Class III Waters)	Standard Units (s.u.)	Shall not vary more than one unit above or below natural background of predominantly fresh waters and coastal waters as defined in paragraph 62302.520(3)(b), F.A.C. or more than two-tenths unit above or below natural background of open waters as defined in paragraph 62-302.520(3)(f), F.A.C., provided that the pH is not lowered to less than 6 units in predominantly fresh waters, or less than 6.5 units in predominantly marine waters, or raised above 8.5 units. If natural background is less than 6 units, in predominantly fresh waters or 6.5 units in predominantly marine waters, the pH shall not vary below natural background or vary more than one unit above natural background of predominantly fresh waters and coastal waters, or more than two-tenths unit above natural background of open waters. If natural background is higher than 8.5 units, the pH shall not vary above natural background or vary more than one unit below natural background of predominantly fresh waters and coastal waters, or more than two tenths unit below natural background of open waters.

The current Class III water quality criteria for predominantly freshwaters allows pH to vary 1.0 standard unit (s.u.) above natural background when the natural background is less than a pH of

6 s.u. As set out more fully below, Pace Swamp has the natural background pH of 4.35 s.u., therefore, the currently applicable pH criterion value is 5.35, which is 1 s.u. above natural background.

Pace Swamp is roughly 144 acres in size and comprised mostly of hardwood swamp habitat that transitions to the southwest as a salt marsh floodplain wetland of the Simpson River. The Simpson River eventually drains into the Escambia River and is one of a number of tributaries to the Escambia River. The biological monitoring results for Pace Swamp using the Florida Wetland Condition Index indicate that a healthy, well balanced floral and faunal community is being maintained, regardless of the treated effluent that has been historically discharged through a series of diffusers distributed along the eastern edge of the wetlands. None of the waterbody identification units within the proposed SSAC extent have been listed as impaired for other parameters. The State has concluded that the scientific evidence clearly supports that a Type II pH SSAC with the aforementioned magnitude will continue to fully support healthy biological communities in the future and is appropriate for Pace Swamp.

The application of a pH SSAC is supported by a demonstration that the designated uses of Pace Swamp will continue to be fully supported at an upper pH limit of 7.0 s.u., while also providing Pace Water System Inc. the requested regulatory relief. The SSAC will also maintain minimum pH criteria by specifying that the pH in the wetland shall not vary below a natural background level of 4.35 (s.u.)

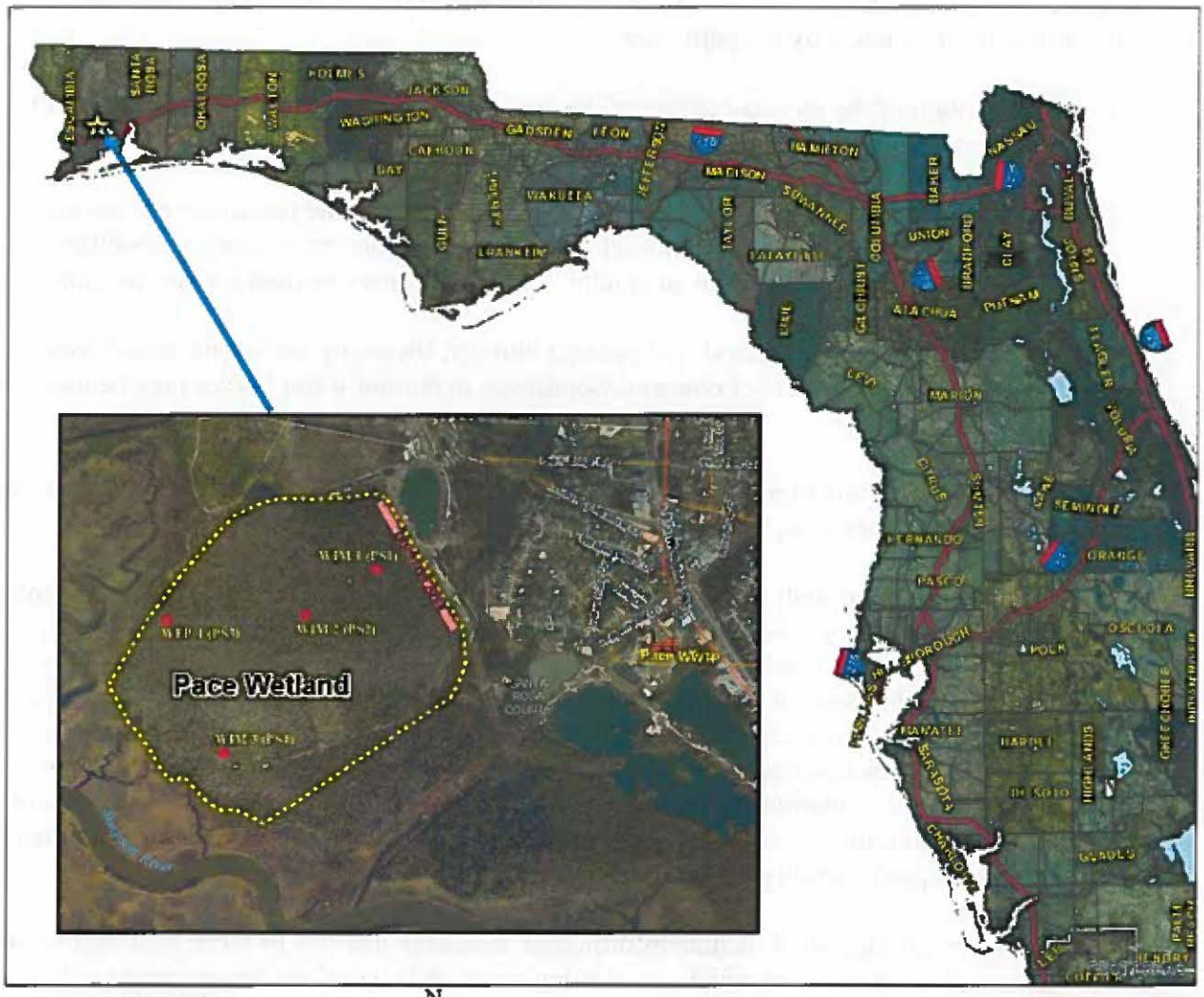
EPA's Analysis

The Pace Water System, Inc. filed a petition with FDEP requesting the establishment of a Type II SSAC for pH in Pace Swamp located in Santa Rosa County, Florida based on site specific conditions. The SSAC is based on monitoring data collected for the chemical parameter of pH and biological data collected using the Wetland Condition Index methodology from Pace Swamp and an adjacent control site. The SSAC will be effective for the CWA purposes after it is approved by the EPA. The SSAC provides as follows:

Subsection 62-302.800(6), F.A.C.:

Water Body and Class	Site Specific Alternative Criteria	County(s)
(e) Pace Swamp as delineated on the map titled "Pace Swamp pH SSAC Boundary," dated July 1, 2014, which is incorporated by reference herein. Copies of this document may be obtained by writing to: Florida Department of Environmental Protection 2600 Blair Stone Road, MS 6511, Tallahassee, FL 32399-2400. Class III.	pH shall not exceed 7.0 standard units in more than 10 percent of the measurements collected during a calendar year, nor vary below natural background.	Santa Rosa

The pH SSAC applies to Pace Swamp as depicted on the map titled "Pace Swamp pH SSAC Boundary," dated July 1, 2014, incorporated by reference in Rule 62-302.800, F.A.C.



General Location of Pace Wetland

Map created by FDEP Standards Development Section on 7/1/14.
Map for display purposes only, not for analysis.
Contact G. Payne (850) 245-8423,

The procedures for developing a Type II SSAC are set out in Rule 62-302.800(2), F.A.C., which provides that: affected persons may petition FDEP, or FDEP may initiate rulemaking, to adopt an alternative water quality criterion for a specific waterbody, or portion thereof, on the basis of site-specific reasons other than those set out in subsection 62-302.800(1), F.A.C. The following demonstrations must be made by the petitioner:

1. A description of the physical nature of the specified waterbody and the water pollution sources affecting the criterion to be altered.

2. A description of the historical and existing water quality of the parameter of concern including, spatial, seasonal and diurnal variations, and other parameters or conditions which may affect it. Conditions in similar water bodies may be used for comparison.

3. A description of the historical and existing biology, including variations, which may be affected by the parameter of concern. Conditions in similar water bodies may be used for comparison.

4. A discussion of any impacts of the proposed alternative criteria on the designated use of the waters and adjoining waters.

5. The demonstration shall also include a risk assessment that determines the human exposure and health risk associated with the proposed alternative criterion, except on a showing that no such assessment is relevant to the particular criterion. The risk assessment shall include all factors and follow all procedures required by generally accepted scientific principles for such an assessment, such as analysis of existing water and sediment quality, potential transformation pathways, the chemical form of the compound in question, indigenous species, bioaccumulation and bioconcentration rates, and existing and potential rates of human consumption of fish, shellfish and water. If the results of the assessments of health risks and aquatic toxicity differ, the more stringent result shall govern.

6. The demonstration shall include information indicating that one or more assumptions used in the risk assessment on which the existing criterion is based are inappropriate at the site in question and that the proposed assumptions are more appropriate or that physical or chemical characteristics of the site alter the toxicity or bioavailability of the compound. Such a variance of assumptions, however, shall not be a ground for a proposed alternative criterion unless the assumptions characterize a factor specific to the site, such as bioaccumulation rates, rather than a generic factor, such as the cancer potency and reference dose of the compound. Man-induced pollution that can be controlled or abated shall not be deemed a ground for a proposed alternative criterion.

FDEP developed a Technical Support Document (TSD) that describes the technical basis for the pH SSAC. The following summarizes the analyses of the factors 1-4 set out above Factors 5 and 6 are generally related to human health and are not relevant to the EPA's review of this pH SSAC, which is an aquatic life criterion.

Additionally, the EPA's implementing regulation found at 40 CFR 131.11(b)(1) provides, when a state establishes numeric criteria, those numeric values should be based on (i) 304(a) Guidance, (ii)

304(a) Guidance modified to reflect site-specific conditions, or (iii) other scientifically defensible methods. Furthermore, 40 CFR 131.11(a) requires that state-adopted criteria protect the designated uses of state waters.

Physical description and water pollution sources.

Pace Swamp is located in Santa Rosa County (Figure 1). The wetland is a hardwood swamp that comprises a small part of the floodplain wetland of the Simpson River. The Simpson River eventually drains into the Escambia River and is one of a number of tributaries to the Escambia River. Pace Swamp covers approximately 144 acres. The edge of the forested wetland transitions into salt marsh that fringes this part of the Escambia River.

The floodplain forest is dominated by black gum (*Nyssa sylvatica*) and sweet bay magnolia (*Magnolia virginiana*), although there are other canopy trees well-represented, including water hickory (*Carya aquatica*), slash pine (*Pinus elliottii*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), swamp laurel oak (*Quercus laurifolia*) and pond cypress (*Taxodium ascendens*) (Wetland Sciences, Inc., 2013). The canopy is largely closed, although Hurricane Ivan (2004) knocked down many trees and created temporary openings in the canopy. The forest is re-growing rapidly, however, and the canopy cover is reasserting itself. A healthy understory, including shrubs and herbaceous vegetation, especially several species of ferns, is found throughout the site. Flow from the site is generally west southwest to a healthy saltmarsh that fringes the Simpson River. The site is bounded on both the north and south by similar hardwood swamp floodplains.

The facility constructed a long, elevated boardwalk through the center of the swamp and several of the long-term water quality monitoring stations are located just off the boardwalk. The facility discharges treated effluent through a series of diffusers that are distributed along the eastern edge of the wetlands. Effluent exits the diffusers onto riprap and then sheetflows into the wetlands. Within the wetlands, the effluent flow helps to maintain saturated soil conditions. Surface flow typically is expressed as small, shallow channels or seepages with dark, tannic water.

The pollution source was first proposed in 1996 by Pace Water System, Inc., to use Pace Swamp as receiving waters for its effluent as allowed under the wetlands application rules in Chapter 62-611, F.A.C. This rule chapter specifically allows domestic wastewater facilities to use forested wetlands as discharge sites, provided a number of permitting conditions (including extensive biological monitoring) are met. As part of its baseline study, the facility began collecting biological data including benthic macroinvertebrates, mosquitoes, fish, threatened and endangered species, herbaceous vegetation, woody vegetation (both canopy and subcanopy) and plant tissue analyses.

Conclusion: Based on the information provided in the TSD, the EPA finds the physical description and pollution sources have been adequately described and the scenario in which the SSAC is being applied is consistent with FDEP's regulations found at 62-302.800(2), F.A.C.

Historical and Existing Water Quality

Considerable pH data were collected and analyzed by the staff of the Pace Water System, Inc. (Pace) at four monitoring sites in the Pace wetland from January 2007 through July 2013. The four monitoring sites in the Pace Wetland are located in the forested freshwater portion of the wetland. In

addition to the data from the wetland, a smaller amount of data was also provided for the Simpson River and the effluent discharge. All of the pH monitoring data and associated Quality Assurance/ Quality Control (QA/QC) records provided by Pace were reviewed by FDEP staff to assure that the data utilized in the derivation of the pH SSAC were of suitable quality and were collected using appropriate QA/QC methods. Any data flagged as not meeting the required QA/QC standards were omitted prior to analyses.

Preliminary analyses of the data revealed that pH significantly increased over time and that the pH values at station WEP-01 were influenced to a lesser degree than the other three monitoring sites. Since the biological data indicated that all sites in the wetland were comparable and reflected healthy biological communities, data from the WEP-01 site were omitted from the derivation of the proposed SSAC to avoid biasing the result by using a site that is not reflective of other portions of the wetland that are more directly influenced by the discharge. Additionally, to minimize the influence of the increasing trend observed in the pH data over time, the dataset used to derive the SSAC was limited to the period from 2010 through 2013. This period also corresponds to when much of the biological data showing that the wetland was biologically healthy were being collected. The pH values at the three sites in the wetland were consistently slightly below the pH of the discharge.

The biological data collected during the 2010 to 2013 period were used as endpoints to determine if healthy conditions existed with the alternate, elevated pH levels in Pace Swamp. These data indicated healthy conditions and it can therefore be reasonably concluded that maintaining these pH conditions in the future will provide for the continued full support of a healthy biological community.

Regarding downstream waters, initial assessment of the limited data for the Simpson River indicated that the existing pH criteria for Class III waters are being achieved; therefore, no SSAC for the Simpson River itself is warranted at this time. The proposed SSAC will only apply to the forested freshwater portion of the Pace Wetland and not the Simpson River as the original petition requested.

Conclusion: Based on the information provided in the TSD, the EPA finds that the historical and existing water quality of Pace Swamp has been adequately characterized based on the appropriate synthesis of onsite water quality monitoring data collected over time and is consistent with FDEP's regulations found at 62-302.800(2), F.A.C.

Historical and Existing Habitat and Biology

In 2009, Pace contracted out biological monitoring for several biological metrics including qualitative monitoring of woody vegetation, herbaceous vegetation, fish, threatened and endangered species and data for benthic macro invertebrates. However, since Pace Swamp is a seasonally-flooded, forested wetland, there were periods when sampling sites were dry; therefore, monitoring sites were added so that there were both test wetlands (receiving Pace Water reclaimed water) and control (reference) wetlands (site unimpacted by Pace's discharge, located a mile away). Fish populations and assemblages in both the test and control wetland sites were found to be typical for seasonally-flooded forested wetlands in the Panhandle. Fish populations appeared stable and healthy for such systems. Similarly, mosquito populations were stable over the period of record.

In addition, two separate vegetation Wetland Condition Index (WCI) studies were conducted in October, 2011 and May, 2012. The vegetation WCI is a biological assessment of wetland health, based on the work done by Riess and Brown (2005) at the University of Florida. Riess and Brown also established regional WCI scores, based on unimpacted and relatively unimpacted sites. The vegetation WCI is composed of six biological metrics: percent tolerant indicator species, percent sensitive indicator species, percent exotic macrophyte species, average Coefficient of Conservatism score, percent native perennial species and percent wetland status species. These six metric scores are totaled to derive a final vegetation WCI score. WCI scores decrease with increasing development intensity (i.e., the higher the score, the more unimpacted the site). WCI data resulted in a Test Wetland score of 81.52% of the regional WCI score, while the Control Wetland WCI score was 85.54% of the regional WCI score.

A macroinvertebrate WCI study was also conducted; however, the results are limited to October 2012 because site conditions in the reference wetland were unsuitable for macroinvertebrate sampling in the first half of 2013. The macroinvertebrate WCI is a community-based biological assessment of wetland health, using benthic macroinvertebrates. The assessment measures percent tolerant organisms, percent Mollusca, percent scraper organisms, percent sensitive organisms, Florida Index species and percent Noteridae. The first three metrics increase with increasing development intensity. The latter three metrics show an opposite trend. The six scores are combined for an aggregate final macroinvertebrate WCI score. Final WCI scores decrease with increasing development intensity (i.e., the higher the score, the more unimpacted the site). Data showed that the Test Wetland score was 67.88% of the regional WCI, while the Control Wetland score was 60.17% of the regional WCI. Again, although the scores are limited to sampling in October 2012, the scores are very similar to each other, with the Test Wetland actually scoring slightly higher than the control wetland.

Both historical and recent biological monitoring demonstrate that Pace Swamp is a healthy forested wetland, showing no signs of degradation from Pace Water's discharge. The forest is healthy and where Hurricane Ivan damaged the forest in 2004, it has rapidly regenerated with forest species typical of healthy forested wetlands in the Florida Panhandle. Fish populations are stable. Both plant and benthic macroinvertebrate WCI metrics are comparable between wetlands receiving Pace Water's reclaimed water and reference wetlands, located a mile away.

Conclusion: Based on the information provided in the TSD, the EPA finds that adequate biological monitoring has been appropriately conducted at both the test and control wetland sites. The monitoring results demonstrate that there are healthy, well-balanced flora and fauna at the test site that support its Class III designated uses.

Impacts of the proposed alternative criteria on the designated use of the waters and adjoining waters.

The subject pH SSAC is based on data collected at three sites in Pace Swamp during the period from 2010 through 2013. During this period, Pace wetland exhibited pH levels slightly below the pH of the discharge and was shown to support healthy biological communities.

To derive the proposed pH SSAC, the annual 90th percentile was calculated for each of the three wetland stations included in the analyses. The annual station 90th percentiles ranged from 6.4 to 7.3 s.u. with a mean of 6.7 s.u. To account for the natural variability within the wetland, the final SSAC value was calculated as the 90th percentile of the annual values, which resulted in a value of 6.98 s.u. (i.e., rounded to 7.0 s.u.). The 90th percentile was calculated based on the mean and standard deviation assuming a normal distribution of the data. The 90th percentile calculated in this manner can provide a more accurate estimate of the true percentile of a population than an estimate based on ranking of a limited subpopulation.

The proposed pH SSAC will be applied such that no more than 10 percent of the pH measurements collected within the Pace Wetland SSAC area during any calendar year shall be above 7.0 s.u. The 10 percent allowable exceedance frequency is consistent with the derivation of the SSAC as the 90th percentile of the existing distribution. Approximately 10 percent of the measurements would be expected to be above the 90th percentile under natural conditions; therefore, the allowance of the 10 percent exceedance frequency is expected to minimize Type I errors associated with the use of the 90th percentile. Even though the pH in the Pace Wetland has increased well above natural background conditions over time due to the effluent discharge, the SSAC will also maintain minimum pH criteria by specifying that the pH in the wetland shall not vary below natural background levels.

Based on the information provided and the analyses performed, a SSAC for pH in the forested freshwater portion of the Pace Wetland is recommended such that the pH shall not exceed 7.0 standard units in more than 10 percent of the measurements collected during any calendar year, nor shall the pH vary below natural background levels.

Finally, FDEP found that a thorough review of all of the available information supports the establishment of a Type II SSAC for pH in Pace Swamp. Biological monitoring data indicate a forested hardwood wetland system that is biologically diverse and healthy, fully supporting its Class III designated use.

Conclusion: Based on the information provided and the demonstration conducted in the TSD, the EPA has concluded and finds that the Class III designated use of Pace Swamp and the adjoining or downstream waters will continue to be protected with the SSAC for pH in place.

Endangered Species Act

In addition to the EPA's review pursuant to section 303 of the CWA, section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the Fish and Wildlife Service or the National Marine Fisheries Service, to ensure that their actions are not likely to jeopardize the continued existence of federally listed species or result in the destruction or adverse modification of designated critical habitat of such species. With regard to consultation activities for section 7 of the ESA, the EPA Region 4 has concluded that the Agency's action to approve the Pace Swamp pH SSAC contained in the September 25, 2014, submittal will have No Effect on threatened and endangered species or their critical habitat. The EPA reached this determination because

threatened and endangered species are not present in the action area (e.g., where the SSAC will apply) and designated uses of downstream waters will be protected by the applicable underlying pH criterion.

Conclusion

Based on the reasons outlined above, the EPA concludes that the requirements of the CWA and 40 CFR Part 131 have been met. Therefore, the pH SSAC for Pace Swamp adopted by FDEP on September 16, 2014, is approved by the EPA pursuant to section 303(c) of the Act.

James D. Giattina
Director
Water Protection Division

Date 1/28/15